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Instructions for Conducting State Industrial-Agricultural Solid Waste Surveys

Bureau of Solid Waste Management

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The purpose of an industrial-agricultural solid waste survey is to obtain current information concerning the types, amounts and sources of solid wastes generated, stored, transported, and disposed of by industrial and agricultural enterprises. Such a survey supplies basic quantitative and qualitative data with which efficient and effective plans for managing industrial and agricultural solid wastes can be formulated. Suggested data sheets and an instruction manual for conducting an industrial-agricultural solid waste survey is presented.

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INSTRUCTIONS FOR CONDUCTING STATE

INDUSTRIAL-AGRICULTURAL SOLID WASTE SURVEYS

A Division of Technical Operations
Open-File Report (TO 9.1/0)

written by
JOHN M. SWEETEN, Engineer

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Environmental Health Service
Bureau of Solid Waste Management
1970

PREFACE

The purpose of an industrial-agricultural solid waste survey is to obtain current information concerning the types, amounts and sources of solid wastes generated, stored, transported, and disposed of by industrial and agricultural enterprises. Such a survey will supply basic quantitative and qualitative data with which efficient and effective plans for managing industrial and agricultural solid wastes can be formulated. The information obtained will also provide municipal, county, regional, state, and federal solid waste management agencies with a basis for measuring the effectiveness of enacted solid waste legislation and programs. For purposes of such evaluations, it is hoped that this survey will be conducted periodically rather than only once.

Suggested data sheets and an instruction manual for conducting an industrial-agricultural solid waste survey are enclosed herein. Questions concerning any aspect of the manual or survey forms should be directed to the regional Solid Waste Management Representative, Bureau of Solid Waste Management, of the state concerned.

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MANUAL OF INSTRUCTIONS FOR CONDUCTING STATE INDUSTRIAL-AGRICULTURAL SOLID WASTE SURVEYS

John M. Sweeten*

I. INTRODUCTION

The National Survey of Community Solid Waste Practices initiated in 1966 by the Bureau of Solid Waste Management and conducted by the states did not encompass a survey of industrial or agricultural establishments. The national survey efforts were directed toward identifying community solid waste management practices and evaluating existing disposal facilities.

As states began to complete this survey and to develop their state solid waste management plans, they began to realize the need for specific information on industrial and agricultural solid waste. A few states began to conduct industrial and agricultural surveys shortly after initiating their state survey of community practices. However, financial and manpower limitations prevented almost all states from considering this endeavor. Most states have now realized that a good comprehensive state plan must include industry and agriculture, and many states are now considering an industrial and agricultural survey to supplement the data from their community solid waste management survey. This additional information will provide a better basis for predicting and planning future solid waste management needs.

* Dr. Sweeten is Engineer, Urban Data Section, Basic Data Branch, Division of Technical Operations, Bureau of Solid Waste Management.

An industrial-agricultural solid waste survey should encompass every identifiable type of industrial and agricultural enterprise operating within each state. Specific objectives of an industrial-agricultural solid waste survey are:

1. To determine the sources, types, amounts, and routing to disposal of solid waste produced by industry and agriculture.
2. To determine the cost of solid waste generation and handling to the producers of industrial and agricultural wastes.
3. To determine the extent of use of acceptable solid waste storage, collection, processing, and disposal methods.
4. To determine the role of industry, agriculture, private contractors, and government in the storage, collection, and disposal of these solid wastes.

In order to assist states in initiating their survey and to provide a uniform base of information necessary for national evaluations, as well as interregional and interstate comparisons, the enclosed survey guides and manual of instructions for their use are provided. Two suggested data collection guides are presented to indicate to the State Solid Waste Planning Agencies the types of data that they should collect in their surveys. One data guide is directed towards gathering detailed information. The second guide is a short version of the first form and was designed for gathering more general information. The suggested use of each guide, the methods of conducting the survey, and the selection of survey respondents are discussed herein.

II. DESIGNATION OF RESPONSIBILITIES

To assist the states in conducting an industrial-agricultural solid waste survey, the Bureau of Solid Waste Management will provide the following services to the states:

1. Guidance from the regional Solid Waste Management Representatives.
2. Technical assistance in planning the survey.
3. Processing of data collected in an acceptable form.

In addition, supplemental financial assistance through State and Interstate Solid Waste Planning Grants may be made available in some instances.

Areas of state responsibility in conducting an industrial-agricultural solid waste survey include the following:

1. Compiling lists of potential survey respondents.
2. Designing and reproducing survey questionnaires.
3. Providing personnel to perform the survey.
4. Collecting the survey data.

Detailed information about the above services and responsibilities can be obtained from the regional Solid Waste Management Representatives.

III. SURVEY IMPLEMENTATION*

The following suggestions for implementing the industrial-agricultural solid waste survey are based on experience gained by the Bureau of Solid Waste Management in conducting the National Survey of Community Solid Waste Practices and pilot solid waste surveys of industrial firms.

Population of Potential Respondents

The following sources of information can be used to identify the population of industrial firms and agricultural establishments within the State:

1. Thomas Register
2. Dun and Bradstreet
3. Industrial or Agricultural Trade Associations
4. State Chamber of Commerce
5. State tax records
6. State Directory of Manufacturers
7. State Securities Exchange Commission
8. Other state records

Duplicate listings of firms should be avoided in the inventory of potential respondents. The completeness of the list will directly affect data quality.

*Acknowledgement - Most of the ideas expressed in Part III were submitted by Mr. George A. Garland, Chief, Statistical Services Section, Division of Technical Operations, Bureau of Solid Waste Management.

Use of Interviewers

An industrial-agricultural solid waste survey should be conducted using interviewers instead of a mail-out-and-return approach. Increased depth and accuracy of the information received as well as much higher response rates can be achieved by interviewers. Voluntary response to the survey questionnaire would probably be lethargic. The improved data quality and quantity attained with interviewers will likely offset their higher costs per survey respondent. Moreover, first-hand knowledge of industrial-agricultural solid waste problems gained by the state solid waste management staff from visits and interviews should benefit the state solid waste planning agency.

Sampling Survey

A sampling survey, in contrast to a census survey, utilizes only a portion of the population of potential respondents. Reducing the number of actual survey respondents by sampling lowers the overall cost and time requirements of the survey, thereby making the use of interviewers more attractive. Good relations between the State and its population of potential respondents can be more readily maintained since many firms will not be burdened by the survey. Later surveys may profit from this good will.

Stratification Procedures

A simple technique for sampling the respondents for the survey is to randomly assign numbers to all industrial and agricultural establishments and then randomly select a specified percentage of these firms. However,

to increase experimental precision by removing additional sources of variation, the population of potential respondents can be blocked, or stratified, into similar groups and subgroups. For example, the respondents could be blocked by (1) SIC code to allow representation from all classes of respondents; (2) geographic region (or population zone), to ensure coverage of the entire state; and/or (3) size of establishment, to prevent an imbalance between large and small firms.

Either two-or three-digit SIC numbers can be used to stratify the establishments by industry type. Attempts to gain additional refinement with four-digit SIC numbers may produce an excessive number of strata containing very few or no potential respondents. However, some four-digit SIC codes can be used where appropriate. For example, the State of California classified its industries by two-digit SIC codes, with the exception that major waste producing industries such as sawmills, logging operations, and canneries (which have four-digit SIC numbers) were given an equal status with the major or two-digit industrial groups.[1]

Stratification according to geographic regions can be accomplished using counties or multicounty regions. However, some truly geographical regions may not contain certain industries. Perhaps a more realistic approach is to group all counties into three categories according to their populations, as for example:

1. Metropolitan counties - over 250,000 population.
2. Urban counties - 25,000-250,000 population.
3. Rural counties - less than 25,000 population.

[1]Cornelius, J. Industrial solid waste production and disposal in California. California Vector Views, 16(5): 1-55, May, 1969.

This stratification of noncontiguous counties according to population zone reduces the chances that a stratum will be devoid of potential respondents.

Finally, establishments within a population zone within a SIC code can be stratified according to their size. For industrial firms, the size criterion might be the number of employees, with the line of demarcation between large and small industries set at, say, the median number of employees. For farms, the cultivated acreage can serve as the size index, while for livestock and poultry enterprises, the criterion for gaging establishment size might be the median number of animals.

Sampling Procedures

If the above three level hierarchial classification or a similar stratification scheme is employed, the samples themselves should be drawn using the stratified quota sample method. According to this method, a sampling quota is assigned to each subgroup of respondents. A firm is then randomly selected from the total population of potential respondents and is filed as a sample specimen under the appropriate category. Additional firms are randomly drawn and classified until all the sample quotas have been filled.

The proper sample sizes will depend upon the money and manpower available and upon the number of potential respondents within each subgroup. Uniform sample sizes of at least thirty respondents are desirable but are probably unattainable for many of the strata. Suggested sampling rates within the strata are as follows:

Number of Potential Respondents Within Stratum	Desired Sample Size
5 or less	All
6-20	5
Over 20	25% of firms

The desire for statistical purity should not preclude the use of judgment in drawing samples. Firms that are known to be especially cooperative and/or which constitute the major sector of some industrial or agricultural activity should be included in the survey whether or not they were randomly chosen. However, respondents which were not randomly selected should be so designated when their data is reported.

Gaining Company Access

A letter of introduction from state-wide industrial and agricultural associations or local branches of national associations may prove beneficial in gaining access into a company. These associations may also designate those firms that are most likely to be cooperative. Initial access into company offices and records should be gained through the plant manager or company president.

Locating the most knowledgeable source of information within a corporation and arranging an interview with this person requires prior planning. The primary source of information should be the highest ranking company employee who is actually involved in solid waste handling. A company organization chart can help pinpoint the prospective interviewee so that time-consuming interviews with uninformed persons can be avoided.

Estimation of Waste Quantities

If records of solid waste generation and disposal are unavailable, the quantity of solid waste generated can be estimated by several techniques. Knowledge of plant input, plant output, and the percent of processed materials discarded as waste can perhaps be used to estimate the amount and types of solid waste generated. Knowledge of storage container volumes, the percent of storage capacity utilized, the collection frequency, and the relative amounts of each waste type will yield an estimate of the amounts of solid waste generated. Also, private solid waste collectors may be willing to supply information concerning the waste output of an establishment.

IV. INSTRUCTIONS FOR COMPLETING THE SUGGESTED INDUSTRIAL-AGRICULTURAL SOLID WASTE SURVEY DATA GUIDES

The instructions contained herein were designed to facilitate the interviewers' understanding of the suggested comprehensive data guide located in Part V of this manual. These instructions are addressed specifically to data items requested in the data guide.

Section I. GENERAL INFORMATION

A. Identification of Establishment

1. Name of Establishment--For purposes of this survey, an establishment is defined as an economic unit engaged in one or predominantly one, type of economic activity at a single location. An establishment might comprise only a part of an entire business firm or corporation.

2. Mailing address of establishment--self explanatory.

3. Location of establishment--

(a) The location of the plant, farm, or feedlot at which economic production actually takes place.

(b) An example of location would be: "2 mi. west of Beaconville on U.S. Rt. 87".

4. Person interviewed--the company representative supplying the information.

B. Industrial Classification

1. Size of area in acres or square feet occupied by plant, farm, or feedlot--land area occupied by the establishment at the location specified above.

2. Cultivated farm acreage--the cultivated acreage figure specified here should not exceed the total farm acreage specified above.

3. Standard Industrial Classification--

(a) Use the three digit SIC Group numbers and group names given in the Standard Industrial Classification Manual.

(b) If more than one SIC code applies to the establishment, list the SIC codes in descending order of importance according to the value of production under each classification.

4. Size of Labor Force

(a) "Production Workers", as defined by the U.S. Department of Commerce, Bureau of the Census, are workers (up through the working foreman level) engaged in fabricating, processing, assembling, inspecting, receiving, packing, warehousing, shipping (but not delivering), maintenance, repair, janitoral services, watchman services, product development, auxiliary production for plant's own use (e.g. power plant), record keeping, and other closely associated services. Proprietors and partners should be excluded.

(b) "All Other Employees" refers to nonproduction personnel, including those engaged in the following activities: supervision above working foreman level, sales (including driver

salesmen), sales delivery (truck drivers and helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office functions, executive, purchasing, finance, legal, personal (including cafeteria, etc.), professional and technical. Again proprietors and partners should be excluded.

(c) In determining the number of employees, decimal fractions should be used to designate contributions of part-time employees. For example, if the company employs 15 full-time and 3 half-time production workers plus one summer employee, the total contribution of full-time equivalent production workers should be reported as 15 + 1.5 + 0.25= 16.75 man-years.

(e) The work schedule should be that of full-time employees.

Section II. GENERATION AND PROCESSING OF SOLID WASTES

A. Waste Types--The general waste types listed are defined as follows:

1. Manure--animal feces and urine mixed with bedding, spilled feed, and soil. Only that manure generated by confined animals should be reported so that manure from pasture and range animals which is not actually handled is excluded.

2. Animal carcasses and remains--carcasses, either whole or partially decomposed, which are found on premises.

3. Crop and feed wastes--cellulosic wastes which are generated as a result of farm and feedlot production. Examples of such wastes are: overripe or damaged vegetables, fruits and grains; weathered silage, hay, or grains; milk and milk solids. This category excludes stubble, straw, leaves, stems, vines, or seeds which remain in the field following harvesting operations, unless these items are collected and stockpiled.

4. Food processing wastes--solid and liquid wastes resulting from handling, cutting, sorting, packing, cooking or otherwise altering the form or composition of vegetables, fruit, grain, milk, poultry, and livestock, usually at off-farm or off-feedlot processing plants. This category includes animal tissue wastes resulting from slaughtering, rendering, meat cutting, and meat packing operations.

5. Employee cafeteria waste--garbage and refuse produced by employee cafeterias and snack bars.

6. Residential solid waste--domestic or household solid waste produced by company personnel and their families residing at the location of the establishment. Example: solid waste from on-farm employee housing.

7. Water and sewage treatment sludge--coarse screenings, grit, and dewatered or air-dried sludge from water and/or sewage treatment plants; includes cesspool or septic tank sludges.

8. Incinerator residue--the solid material collected from the process of incineration, consisting of grate siftings, material from the grates, and particulate matter collected from air pollution control devices. Includes combustion residues from all on-site solid waste volume reduction practices (such as on-site incinerators, conical burners, and open burning dumps) which result in material that re-enters the solid waste stream.

9. Soil, stone, ashes--in addition to rocks, sand, silt, gravel, and clay, this category includes concrete, brick, tile, concrete and tile pipes and combustion residues other than those produced by on-site solid waste incinerators.

10. Wood--sawdust, woodpulp, cork; wood poles, posts, lumber; and trees, foliage, noxious weeds.

11. Paper--cardboard, paper packaging materials, pressboard, newspapers, magazines, books, and scrap paper.

12. Textiles--refers to discarded rags, cloth, clothing, carpeting, felt, woven upholstery, burlap bags, rope and yarn. This category also includes matted or unwoven fibers (natural or synthetic) generated as waste in textile manufacturing.

13. Rubber--includes wastes of natural or synthetic rubber products such as tires, foam rubber, insulation, hoses and tubing, as well as rubber-based coverings and upholstery.

14. Leather--applies only to material derived from the hides of animals, and specifically excludes imitations of leather.

15. Glass and pottery--encompasses all blown, molded or spun glass forms such as fiberglass, as well as earthenware, pottery, and ceramics.

16. Plastic--this category is comprised of plastic packaging and covering materials, and all other plastic forms including plastic tubings, moldings, and extruded shapes.

17. Radioactive materials--report total quantity of radioactive waste generated, whether or not this waste is received for disposal by the Atomic Energy Commission. If the amount of such material is classified information and cannot be reported, enter the letter C in the tons/year column.

18. Bulky ferrous metal--items such as appliances, furniture, vehicle bodies and engines, machinery, sheet metal, wire, ductwork, tanks, beams, trusses and metal pipes, any of which is so large, in one or more linear dimensions, as to require special handling.

19. Other ferrous metal--ferrous metal items (iron and steel) that have small enough linear dimensions that they do not require special handling.

20. Nonferrous metals--all nonferrous metals such as copper, brass, aluminum, zinc, and lead.

21. Organic chemicals--solid and liquid compounds containing carbon-hydrogen bonded molecules in straight chain or ring structures with other chemical configurations attached. Examples of organic chemicals are: resins, phenols; asphaltic products, petroleum-based lubricants and fuels; most paints; herbicides, pesticides; most pharmaceuticals.

22. Inorganic chemicals--solid and liquid compounds which do not contain carbon-hydrogen bonds, as for example fertilizers, cyanides, chromates, insoluble silicates (except sand), chlorides, sulfides, sulfates, and inorganic acids.

23. Compost--organic solid waste resulting from the controlled microbial degradation of organic waste. Report as a waste the compost produced by <u>on-site</u> mechanical (continuous mix), ventilated cell or windrow composting methods.

24. Lagoon supernatant and residues--liquids, slurries, and sludges produced in <u>on-site</u> aerobic and anaerobic lagoons. Report as waste the supernatant and sludge actually <u>removed</u> from the lagoons for ultimate disposal elsewhere.

25. Other--report any other solid waste categories which are not included in the foregoing waste types. On the reverse side of the page, define the actual components of the waste category.

B. Quantity of Waste Generated Annually--

1. For each type of solid waste produced, provide a measurement, if available, or an estimate of the waste quantity generated yearly using either the weight basis (tons/yr) or the volume basis (cubic yds/yr).

2. In the event that reliable measurements of both weight and volume of a waste type are available, then both the tons/yr and cubic yds/yr values are desired so that accurate weight-volume conversion factors can be computed.

3. Designate whether the waste quantities were estimated or actually measured by checking the appropriate column.

C. On-site Waste Processing and Volume Reduction--

1. This section applies only to on-site processes for altering the physical form or chemical composition of solid wastes prior to their ultimate disposal.

2. Baling, shredding or grinding, and crushing operations are clearly "Waste processing and volume reduction methods" and should be checked if they are performed on-premises.

3. Composting and incineration are to be classified as processing methods since a residue which the company must ultimately dispose of is produced e.g. waste types 8 and 23.

4. On-site lagooning should be considered as a processing method.

5. Example--Suppose a manufacturing plant generates wastes which are handled as follows: (a) paper--collected by a private contractor who then performs a baling operation; (b) food processing waste--subjected to on-site lagooning with subsequent disposal of supernatant and sludge; (c) employee cafeteria waste--sent to a municipal incinerator; and (d) lumber--burned in an on-premises incinerator. The appropriate entries under Column C would be as follows:

A. Waste Types	C. On-Site Waste Processing and Volume Reduction Methods (check)							
	Baling	Shredding or Grinding	Crushing	Composting	Incineration	Lagooning	Other (specify)	None
4. Food Processing Waste						X		
5. Employee Cafeteria Waste								X
10. Wood					X			
11. Paper								X

Section III. STORAGE OF SOLID WASTES

A. Waste Types--same as for Section IIA above.

B. Area Required for Storage--specify the plant or land area in square feet required for the storage of each waste type entered.

C. Method of Storage--check the method or methods used to store each waste type.

D. Storage Problems--check the problems or inadequacies which characterize the solid waste storage facilities of the company.

E. Total Storage Capacity Utilized--specify the total capacity (in cu. yds.) available from each type of storage container which the establishment utilizes.

Section IV. WASTE COLLECTION AND TRANSPORTATION

A. Waste Types--same as for Section IIA above.

B. Collection Frequency--Indicate the number of times per month the waste types specified in Column A are collected.

C. Primary Method of Waste Transport--

1. Check the principle method by which the wastes are conveyed from the point of storage to the disposal or volume reduction site.

2. If more than one method is used for a given waste type, check the method by which the waste is transported the largest number of miles.

D. Type of Agency Performing Collection--check the type of ownership of the principal waste transportation mechanism indicated in Column C.

E. Company-owned Collection Vehicles

1. In the upper left hand portions of the boxes, indicate the number of company-owned vehicles required to collect the separated or mixed wastes in Column A.

2. Indicate the average size of collection vehicles in the lower right-hand portions of the boxes.

3. For example, the entry 2/5 under Closed Top means that two closed-top collection trucks each with 5 cu. yds. capacity were used to collect and convey the wastes specified in that row.

Section V. DISPOSAL OF SOLID WASTES

A. Waste Types--same as for Section IIA above.

B. Final Disposal and Volume Reduction Methods

1. This section refers to waste disposal methods that represent, to the company generating the waste, a final means of disposal.

2. Disposal and volume reduction facilities that are owned by external solid waste agencies and enterprises are to be considered as "final disposal" methods since the establishment generating the waste has no further responsibility for, or control over, subsequently produced waste residues.

3. In the case of company-owned final (ultimate) disposal facilities, the company does not handle the waste further after the disposal or volume reduction procedure has been completed. If further handling does take place, the practice should be reported as a "processing method" (Section II) and not as a "final disposal method."

4. For example, a municipally-owned incinerator is, from the company's viewpoint, a final method of waste disposal. On the other hand, a company-owned incinerator should be reported as a "processing method" (Section II) since a waste residue must ultimately be disposed of by some other means, such as a sanitary landfill.

5. For each waste type, write the percent of waste disposed of by each of the final disposal methods listed, or by other means.

6. The percentages specified for waste disposal methods should total 100% for each waste type.

7. If the waste quantity specified in Section II was given as tons/yr, these percentage figures should be based upon weight; however, if the annual generation value was given as cu yd/yr, the percentages should be based on waste volume.

8. Alongside the waste percentage figure in each cell, categorize the type of ownership of the waste disposal facility using one of the following code letters: C--company owned, M--municipally owned, P--owned by private contractor, R--owned by a regional authority.

9. Example--Suppose that 25 tons/yr of paper waste is disposed of as follows:

53% or 13.2 tons/yr salvaged by private contractor

28% or 7.0 tons/yr disposed of in a burning municipal dump

19% or 4.8 tons/yr disposed of in a burning dump operated by a private contractor.

The appropriate entries would be as follows:

A. Waste Types	B. Final Disposal and Volume Reduction Methods				
	Salvage	Burning Dump or Pile	Dump - No Burning	Sanitary Landfill	Etc.
11. Paper	53P	28M, 19P			

Section VI. FINAL DISPOSAL AND VOLUME REDUCTION SITES

A. Final Disposal and Volume Reduction Methods

1. These are the same methods listed under Section VB.

2. In this section, the term "Final Disposal and Volume Reduction Methods" shall have the same meaning as in Section VB.

B. Haul Distance to Final Disposal or Volume Reduction Facility

1. Specify the approximate distance that waste is transported from the point of collection to each disposal facility, regardless of the waste collection agencies and transportation methods reported in Section IV.

2. Enter the mileage figure in the row and column which best describes: (a) the type of disposal or reduction facility; and (b) the type of site ownership.

3. For example, if the establishment owns a sanitary landfill located 0.5 miles away and also utilizes a privately-owned sanitary landfill 11.5 miles distant, the correct entry would be as follows:

A. Final Disposal and Volume Reduction Method	B. Haul Distance to Final Disposal or Volume Reduction Facility, Miles			
	Company-Owned	Private Contractor	Municipality	Regional Authority
4. Sanitary Landfill	0.5	11.5		

C. Company-owned Final Disposal Facilities

1. Give the approximate date that each company-owned and operated disposal or volume reduction practice or facility was first utilized, initiated, or constructed.

2. Give the estimated remaining life in years of the disposal or volume reduction facility or practice.

3. Report the space (land area or building area, whichever is more applicable) committed by the establishment for the disposal or volume reduction of solid wastes.

Section VII. EXPENDITURES FOR SOLID WASTE MANAGEMENT

A. Solid Waste Management Function

1. The capital and operating costs to the establishment for waste management activities should be broken down, when practicable, into four major functions--processing, storage, collection, and disposal.

2. The row entitled Totals should be completed only when a particular expenditure requested cannot be separated by solid waste management function.

B. Internal Capital Cost of Function

1. The term "Internal" capital cost refers to the initial capital cost incurred by the establishment for solid waste management activities.

2. Initial Capital Investment includes the cost of equipment, buildings, land, site preparation, and installation.

3. Estimated Life Remaining is an approximate average life of all company-owned buildings and equipment involved in a function, but does not include the life of land.

C. Internal Annual Expenditures

1. Report the approximate number of man-hours/year required within the establishment to perform solid waste management activities.

2. Annual operating cost includes labor, parts, supplies, utilities, and miscellaneous expenditures, but excludes depreciation.

D. Annual Charges by External Solid Waste Handlers

1. Specify the annual cost incurred by the company for storage, collection, and/or disposal of company-generated wastes by either a private contractor, a municipality, or a regional authority.

2. If an item of annual cost is unavailable but is a significant value, enter the letter U in the appropriate box.

E. Total Annual Cost of Function--Provide the total annual cost of a function only if separate cost figures are not available for

internal and external solid waste handling costs.

F. Total Annual Return from Salvage--Give the approximate total return (i.e. cash, goods and services) to the establishment in exchange for waste items which were disposed of by the company and which actually entered the solid waste stream.

Section VIII. ENTERPRISE PRODUCTION DATA

A. Annual Production Characteristics

1. The major products of the company are those which show the greatest value of production.

2. The four-digit SIC number pertaining to the major products listed should be specified.

3. Data concerning the annual yield of major products can be useful in the determination of solid waste generation indices. However, the establishment may be highly reluctant to supply this data.

4. Annual or quarterly reports by the company may contain production data.

B. Production Input Factors

1. Major input raw materials and resources are those factors needed that are essential for production.

2. Examples of input factors are yarn, pig iron, land, fertilizer, and electronic components.

3. The establishment may choose not to reveal the information concerning quantities of production factors required.

V. SUGGESTED INDUSTRIAL-AGRICULTURAL SOLID WASTE SURVEY DATA GUIDE

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INDUSTRIAL--AGRICULTURAL SOLID WASTE SURVEY

Suggested Data Collection Guide

Date of Interview: _____

☐ Industrial
☐ Agricultural

I. GENERAL INFORMATION

A. Identification of Establishment

1. Name of Establishment: _____

2. Mailing Address of Establishment: _____
(Number) (Street)

_____
(City) (County) (State) (Zip)

3. Location of Establishment: _____

4. Person Interviewed: _____
(Name) (Title) (Phone No.)

B. Industrial Classification

1. Size of Area Occupied by Plant, Farm, or Feedlot: _____ (Specify) ☐ Acres ☐ Sq. ft. (Check One)

2. If establishment is a farm, give its cultivated acreage: _____ acres.

3. Standard Industrial Classification

SIC Group No. (3-digit)	SIC Group Name of Industry
(a) _____	(a) _____
(b) _____	(b) _____
(c) _____	(c) _____

4. Size of Labor Force

Type of Employee	Total Number of Employees	Employees' Work Schedule		
		No. Hours/Day	No. Days/Week	No. Weeks/Year
Production Workers				
All Other Employees				

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II. GENERATION AND PROCESSING OF SOLID WASTES

A. Waste Types	B. Quantity of Waste Generated Annually						C. On-Site Waste Processing and Volume Reduction Methods (Check Methods Used)								
	Tons/yr	Cubic Yds/yr	Is This an Estimate of Waste Quantity?		Does Waste Generation Rate Fluctuate Seasonally?		Baling	Shredding or Grinding	Crushing	Composting	Incineration	Lagooning	Other (Specify)	None
			Yes	No	Yes	No								
1. Manure w/Bedding, Feed, Soil														
2. Animal Carcasses & Remains														
3. Crop & Feed Wastes														
4. Food Processing Wastes														
5. Employee Cafeteria Wastes														
6. Residential Solid Waste														
7. Water & Sewage Treatment Sludge														
8. Incinerator Residue*														
9. Soil, Stone, Ashes														
10. Wood														
11. Paper														
12. Textiles														
13. Rubber														
14. Leather														
15. Glass & Pottery														
16. Plastics														
17. Radioactive Materials														
18. Bulky Ferrous Metal														
19. Other Ferrous Metal														
20. Non-Ferrous Metal														
21. Organic Chemicals														
22. Inorganic Chemicals														
23. Compost*														
24. Lagoon Supernatant & Residue*														
25. Other (Specify)														

*Residues and intermediate products that resulted from on-site or company-owned solid waste processing and volume reduction practices.

III. STORAGE OF SOLID WASTES

A. Waste Types	B. Area Required for Storage sq. ft.	C. Method of Storage (Check)								D. Storage Problems (Check where Applicable)						
		Galvanized Can	Compacting Container	Closed Bulk Container	Open Bulk Container	Pallet	Open Pile	Covered Pile	Other (Specify)	Inadequate Capacity	Vectors	Odors	Drainage	Unsightly	Difficulty in Handling	Other (Specify)
1. Manure w/Bedding, Feed, Soil																
2. Animal Carcasses & Remains																
3. Crop & Food Wastes																
4. Food Processing Wastes																
5. Employee Cafeteria Wastes																
6. Residential Solid Waste																
7. Water & Sewage Treatment Sludge																
8. Incinerator Residue*																
9. Soil, Stone, Ashes																
10. Wood																
11. Paper																
12. Textiles																
13. Rubber																
14. Leather																
15. Glass & Pottery																
16. Plastics																
17. Radioactive Materials																
18. Bulky Ferrous Metal																
19. Other Ferrous Metal																
20. Non-Ferrous Metal																
21. Organic Chemicals																
22. Inorganic Chemicals																
23. Compost*																
24. Lagoon Supernatant & Residue*																
25. Other (Specify)																
E. Total Storage Capacity Utilized, Cu. Yds.																

*Residues and intermediate products that resulted from on-site or company-owned processing and volume reduction practices.

IV. WASTE COLLECTION AND TRANSPORTATION

A. Wastes Types	B. Collection Frequency (Times/Month)	C. Primary Method of Waste Transport (Check only one)						D. Type of Agency Performing Collection (Check)				E. Company-Owned Collection Trucks Number/Capacity (cu. yds.)				
		Truck	Rail	Pipeline	Barge or Ship	Belt, Chain, or Screw Conveyor	Other (Specify)	Company Employees	Private Contractor	Municipality	Regional Authority	Compacting Truck	Covered Non-Compacting Truck	Open Top Non-Compacting Truck	Tank Truck	Other (Specify)
1. Manure w/Bedding, Feed, Soil																
2. Animal Carcasses & Remains																
3. Crop & Feed Wastes																
4. Food Processing Wastes																
5. Employee Cafeteria Wastes																
6. Residential Solid Waste																
7. Water & Sewage Treatment Sludge																
8. Incinerator Residue*																
9. Soil, Stone, Ashes																
10. Wood																
11. Paper																
12. Textiles																
13. Rubber																
14. Leather																
15. Glass & Pottery																
16. Plastics																
17. Radioactive Materials																
18. Bulky Ferrous Metal																
19. Other Ferrous Metal																
20. Non-Ferrous Metal																
21. Organic Chemicals																
22. Inorganic Chemicals																
23. Compost*																
24. Lagoon Supernatant & Residue*																
25. Other (Specify)																

*Residues and intermediate products that resulted from on-site or company-owned solid waste processing and volume reduction practices.

V. DISPOSAL OF SOLID WASTES

A. Waste Types	B. Final Disposal and Volume Reduction Methods (Indicate Percent of Waste Disposed of by Each Method and the Type of Ownership of Disposal Facilities)**												
	Salvage	Burning Dump or Pile	Dump - No Burning	Sanitary Landfill	Spread on Land	Lagoon	Composting	Conical Burner	Incinerator	Sea Disposal	Fed to Swine	Underground Injection	Other _____ (Specify)
1. Manure w/Bedding, Feed, Soil													
2. Animal Carcasses & Remains													
3. Crop & Feed Wastes													
4. Food Processing Wastes													
5. Employee Cafeteria Wastes													
6. Residential Solid Waste													
7. Water & Sewage Treatment Sludge													
8. Incinerator Residue*													
9. Soil, Stone, Ashes													
10. Wood													
11. Paper													
12. Textiles													
13. Rubber													
14. Leather													
15. Glass & Pottery													
16. Plastics													
17. Radioactive Materials													
18. Bulky Ferrous Metal													
19. Other Ferrous Metal													
20. Non-Ferrous Metal													
21. Organic Chemicals													
22. Inorganic Chemicals													
23. Compost*													
24. Lagoon Supernatent Residue*													
25. Other (Specify)													

*Residues and intermediate products that resulted from company-owned solid waste processing and volume reduction practices.

**For each waste type, specify the percent of waste disposed of by each method. Alongside this percent figure, categorize the disposal facility owner according to these code letters: C – company owned, P – private contractor, M – Municipality, R – regional authority. Example – If 85% of a waste type is disposed of in a municipal facility, enter 85M in the appropriate cell.

VI. FINAL DISPOSAL AND VOLUME REDUCTION SITES

Note: On the reverse side of this page, give the names and addresses of off-premises disposal and volume reduction installations.

A. Final Disposal and Volume Reduction Methods	B. Haul Distance to Final Disposal or Volume Reduction Facility, Miles (Specify Mileage According to Site Ownership)				C. Company-Owned Final Disposal Facilities			
	Company-Owned	Private Contractor	Municipality	Regional Authority	Date Initiated or Constructed month-year	Estimated Remaining Life Years	Space Requirements	
							Building Area ft^2	Land Area Acres
1. Salvage								
2. Dump-Burning								
3. Dump-No Burning								
4. Sanitary Landfill								
5. Spread on Land								
6. Lagoon								
7. Composting								
8. Conical Burner								
9. Incinerator								
10. Sea Disposal								
11. Fed to Swine								
12. Underground Injection								
13. Other _____ (Specify)								

VII. EXPENDITURES FOR SOLID WASTE MANAGEMENT

A. Solid Waste Management Function	B. Internal Capital Cost of Function		C. Internal Annual Expenditures		D. Annual Charges by External Solid Waste Handlers			E. Total Annual Cost of Function $/Yr
	Initial Capital Investment Dollars	Est. Life Remaining Years	Labor Requirements Man-hours/Yr	Annual Operating Costs $/Yr	Private Contractor $/Yr	Municipality $/Yr	Regional Authority $/Yr	
Processing								
Storage								
Collection								
Disposal								
Total								

F. Total Annual Return From Salvage = $_____/yr

VIII. ENTERPRISE PRODUCTION DATA

Note: The data requested in this section may be considered privileged (confidential) information by the company, in which case the establishment should not be compelled to divulge it.

A. Annual Production Characteristics

Major Products of Company	SIC Number (4-Digit) of Product Category	Annual Yield of Products (Use the Most Appropriate Units of Measure)				
		Tons/Yr	Gallons/Yr	Cubic Yds/Yr	Number (Head)/Yr	Other Units (Specify)
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						

B. Production Input Factors

Major Types of Input Materials and Resources	Quantity of Materials and Resources Required for Production (Specify Using the Most Appropriate Units of Measure)					
	Tons/Yr	Gallons/Yr	Cubic Yds/Yr	Number (Head)/Yr	Acres/Yr	Other Units (Specify)
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						

VI. INSTRUCTIONS FOR COMPLETING THE SHORT FORM OF THE SUGGESTED INDUSTRIAL-AGRICULTURAL SOLID WASTE SURVEY DATA GUIDE

The instructions contained in this part of the manual apply to the shortened data guide presented in Part VII below. Because of the similarity between the abridged and unabridged suggested data guides, references to the instructions contained in Part IV of the manual are sometimes made.

Section I. GENERAL INFORMATION

A. Identification of Establishment--Use the instructions given in Part IV of this manual.

B. Industrial Classification

1. Use the three-digit SIC Group Number, given in the Standard Industrial Classification Manual, which best describes the establishment.

2. Use the SIC Group Name that corresponds to the three-digit SIC Group Number.

3. Size of Area Occupied by Plant, Farm, or Feedlot--the total land area occupied by the establishment at its location named above.

4. Cultivated Farm Acreage--the cultivated acreage figure specified here should not exceed the total farm acreage given above.

5. Size of Labor Force--Use the same instructions as for Part IV, Section IB.

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Section II. COMPANY-OWNED DISPOSAL AND VOLUME REDUCTION FACILITIES

A. Company-owned Disposal Facilities or Practices--This column refers to solid waste disposal facilities which are leased, owned, and/or operated by the company.

B. Date initiated or Constructed--Give the approximate date that each company-owned disposal or volume reduction facility was first utilized, initiated, or constructed.

C. Estimated Remaining Life--Give the estimated number of years that the disposal or volume reduction facility or practice will be utilized for waste disposal by the company.

D. Space Required for Company-Owned Disposal Operations--Report the space (land area or building area, whichever is more appropriate) committed by the establishment for the disposal or reduction of solid wastes.

Section III. GENERATION AND DISPOSAL OF SOLID WASTES

A. Waste Types--The waste types listed in this column were defined in Part IV, Section IIA, of this manual.

B. Quantity of Waste Generated Annually--For each type of solid waste produced, provide a measured or an estimated value for the quantity generated annually, using either a weight or volume basis. However, if reliable measurements of both weight and volume of a waste type are available, then both the tons/year and cubic yards/year values are desirable inasmuch as weight-volume conversion factors can then be calculated.

C. Disposal and Volume Reduction Methods

1. In this section, as contrasted to the instructions given in Section VB of Part IV (which was written for the long form of the survey data guide), the "Disposal and Volume Reduction Methods" referred to are not strictly or necessarily ultimate disposal methods.

2. Volume reduction methods such as incineration, whether performed on-or off-premises, should be checked if applicable. Incinerator residue produced on-premises can then be reported as waste type 8, whose method of disposal should then be indicated.

3. Lagooning and composting should also be checked as disposal methods since the resultant residues, if produced on-premises, can be reported as wastes under waste types 23 and 24.

4. The methods used to dispose of each waste type are to be indicated by placing a code letter in the appropriate waste type row and disposal method columns.

5. The code letters, which refer to the type of ownership of the disposal site or facility utilized, are to be chosen from the following list: C - company owned, P - owned by private contractor, M - municipally owned, R - owned by regional authority.

6. For example, if animal carcasses are disposed of in a company-owned burning dump and in a municipally-owned sanitary landfill, the correct entry would be as follows:

A. Waste Types	B. Quantity Generated...	C. Disposal and Volume Reduction Methods						
		Salvage	Burning Dump or Pile	Dump - No Burning	Sanitary Landfill	Spread on Land	Lagoon	Etc.
2. Animal Carcasses and Remains	...		C		M			

Section IV. STORAGE AND COLLECTION OF SOLID WASTES

A. Waste Types--See instructions for Section IIIA.

B. Methods of Solid Waste Storage--For each waste type generated, place a check mark in the columns which best describe the waste storage methods utilized.

C. Type of Agency Performing Collection--For each waste type designate the type of agency which performs the solid waste collection service by placing a check mark in the appropriate column.

D. Type of Collection Vehicle--Place a check mark in the column which best describes the type of collection vehicle, regardless of its ownership, which collects and transports each waste type generated.

VII. SHORT FORM OF THE SUGGESTED INDUSTRIAL-AGRICULTURAL SOLID WASTE SURVEY DATA GUIDE

INDUSTRIAL--AGRICULTURAL SOLID WASTE SURVEY
Suggested Data Collection Guide--Short Form

☐ Industrial
☐ Agricultural

Date of Interview: _____

I. GENERAL INFORMATION

A. Identification of Establishment

1. Name of Establishment: _____

2. Mailing Address of Establishment: _____
(Number) (Street)

_____
(City) (County) (State) (Zip)

3. Location of Establishment: _____

4. Person Interviewed: _____
(Name) (Title) (Phone No.)

B. Industrial Classification

1. SIC Group No. (3-digit) _____ 2. SIC Group Name of Industry _____

3. Size of Area Occupied by Plant, Farm, or Feedlot: _____ ☐ acres ☐ sq. ft. (Check one)

4. If establishment is a farm, give its cultivated acreage: _____ acres

5. Size of Labor Force:

Type of Employee	Total No. of Employees	Employees' Work Schedule		
		No. Hours/Day	No. Days/Week	No. Weeks/Year
Production Workers				
All Other Employees				

II. COMPANY-OWNED DISPOSAL AND VOLUME REDUCTION FACILITIES

A. Company-Owned Disposal Facilities or Practices	B. Date Initiated or Constructed Month-Year	C. Estimated Remaining Life Years	D. Space Required for Company-Owned Disposal Operations	
			Building Area ft^2	Land Area acres
1. Salvage				
2. Burning Dump or Pile				
3. Dump - No Burning				
4. Sanitary Landfill				
5. Spread on Land				
6. Lagoon				
7. Composting				
8. Conical Burner				
9. Incinerator				
10. Sea Disposal				
11. Swine Feeding				
12. Underground Injection				
13. Other (Specify)				

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III. GENERATION, AND DISPOSAL OF SOLID WASTES

A. Waste Types	B. Quantity of Waste Generated Annually						C. Disposal and Volume Reduction Methods (Indicate Methods Used and Type of Ownership)**												
	Tons/Yr	Cubic Yds/Yr	Is This an Estimate of Waste Quantity?		Does Waste Generation Rate Fluctuate Seasonally?		Salvage	Burning Dump or Pile	Dump - No Burning	Sanitary Landfill	Spread on Land	Lagoon	Composting	Conical Burner	Incinerator	Sea Disposal	Fed to Swine	Underground Injection	Other (Specify)
			Yes	No	Yes	No													
1. Manure w/Bedding, Feed, Soil																			
2. Animal Carcasses & Remains																			
3. Crop & Feed Wastes																			
4. Food Processing Wastes																			
5. Employee Cafeteria Wastes																			
6. Residential Solid Waste																			
7. Water & Sewage Treatment Sludge																			
8. Incinerator Residue*																			
9. Soil, Stone, Asher																			
10. Wood																			
11. Paper																			
12. Textile																			
13. Rubber																			
14. Leather																			
15. Glass & Pottery																			
16. Plastics																			
17. Radioactive Materials																			
18. Bulky Ferrous Metal																			
19. Other Ferrous Metal																			
20. Non Ferrous Metal																			
21. Organic Chemicals																			
22. Inorganic Chemicals																			
23. Compost*																			
24. Lagoon Supernatant & Residue*																			
25. Other (Specify)																			

*Report the quantity of residues and intermediate products that resulted from on-site or Company-owned solid waste processing and/or volume reduction practices.

**For each waste type generated, specify the methods of disposal or volume reduction used by placing one of the following code letters, which designate the type of disposal facility ownership, in each of the applicable disposal method columns: C - Company owned, P - private contractor, M - municipality, R - regional authority.

IV. STORAGE AND COLLECTION OF SOLID WASTES

A. Waste Types	B. Check Methods of Solid Waste Storage Used								C. Type of Agency Performing Collection (Check)				D. Check Type of Collection Vehicles				
	Galvanized Can	Compacting Container	Closed Bulk Container	Open Bulk Container	Pallet	Open Pile	Covered Pile	Other (specify)	Company Employees	Private Contractor	Municipality	Regional Authority	Compacting Truck	Covered Non-Compacting Truck	Open Top Truck	Tank Truck	Other (Specify)
1. Manure w/Bedding, Feed, Soil																	
2. Animal Remains & Carcasses																	
3. Crop & Feed Wastes																	
4. Food Processing Wastes																	
5. Employee Cafeteria Wastes																	
6. Residential Solid Waste																	
7. Water & Sewage Treatment Sludge																	
8. Incinerator Residue																	
9. Soil, Stone, Ashes																	
10. Wood																	
11. Paper																	
12. Textile																	
13. Rubber																	
14. Leather																	
15. Glass & Pottery																	
16. Plastics																	
17. Radioactive Materials																	
18. Bulky Ferrous Metal																	
19. Other Ferrous Metal																	
20. Non Ferrous Metal																	
21. Organic Chemicals																	
22. Inorganic Chemicals																	
23. Compost																	
24. Lagoon Supernatant & Residue																	
25. Other (Specify)																	